Corporate governance and bank capitalization strategies[1]

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Abstract: This paper examines the relationship between banks' capitalization strategies and their corporate governance and executive compensation schemes for an international sample of banks over the 2003-2011 period. Shareholder-friendly corporate governance, in the form of a separation of the CEO and chairman of the board roles, intermediate board size, and an absence of anti-takeover provisions, is associated with lower bank capitalization, consistent with shareholder incentives to shift risk towards the financial safety net. Higher values of executive option and stock wealth invested in the bank are associated with higher capitalization as a potential reflection of executive risk aversion, but the risk-taking incentives embedded in executive compensation packages are associated with lower capitalization.

Key words: Bank capital; Dividend payouts; Corporate governance; Executive compensation

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1. Introduction

A failing bank can be defined as one that has insufficient capital. Bank capitalization strategies thus are crucial in determining the probability of bank failure both at the individual bank level and at the systemic level. Two key aspects of bank capitalization strategies can be distinguished.

First, a bank has to determine its level of capitalization under normal business conditions. This normal level of bank capital corresponds to the bank's level of capital before it is hit by any major shock that can have an adverse impact on bank capital. A higher normal, pre-crisis level of capital should increase a bank's chances of withstanding major income shocks. Confirming this, Berger and Bouwman (2013) find that higher levels of pre-crisis capital increase a bank's probability of survival during a banking crisis. Along similar lines, Beltratti and Stulz (2012) and Demirguc-Kunt, Detragiache and Merrouche (2013) find that banks that were better capitalized before the crisis had a better stock market performance during the crisis.

Second, a bank has to decide whether to cut its net payouts to bank stock investors in case of negative income shocks so as to preserve capital. A conservative bank would tend to reduce dividends and share repurchases and possibly increase share issuance after experiencing major losses. Acharya, Gujral and Shin (2009), however, show that many of the world's largest banks continued to pay significant dividends in the initial phase of the crisis in 2008 before the demise of Lehman, increasing their riskiness.

Banks are subject to regulatory requirements in the form of minimum capital ratios and – depending on individual circumstances – restrictions on payouts to bank stock investors to prevent capital shortfalls that may give rise to bank failure. In practice, however, banks continue to enjoy considerable discretion in their capitalization policies. Using data for an international sample of banks, we empirically examine various aspects of corporate

governance structures and executive compensation schemes to see how they are related to bank capitalization strategies over the period 2003-2011.

Corporate governance is a set of rules that resolve potential conflicts between managers and shareholders. For banks especially, value-maximizing shareholders may favor risky capitalization strategies so as to increase the option value of potential public bailout guarantees as reflected in bank share prices. In our empirical work, we investigate whether banks with shareholder-friendly corporate governance adopt relatively risky bank capitalization strategies.

We consider three main aspects of banks' corporate governance: board independence, board size, and anti-takeover provisions. Aspects of corporate governance that are considered to favor shareholder interests are: boards that are independent (and particularly not chaired by the CEO), boards of intermediate size (large enough to be effective, but not so large that free rider problems become pressing), and an absence of anti-takeover provisions (which would restrict the operation of the market for corporate control).

Our results indicate that banks with shareholder-friendly corporate governance tend to have lower capitalization. These results are consistent with the hypothesis that banks with shareholder-friendly corporate governance adopt risky capitalization strategies in order to maximize shareholder value.[2] Some aspects of shareholder-friendly corporate governance (and in particular separation of the CEO and chairman roles, and intermediate board size), are associated with a tendency for banks to scale back payouts to shareholders after experiencing a negative income shock. This suggests that banks with already low capitalization rates prior to a negative income shock need to reduce payouts to shareholders after experiencing an

[2] Convex pay-offs to shareholders resulting from limited liability provide firms with incentives to create risk (see Galai and Masulis, 1976, and Jensen and Meckling, 1976). Explicit and implicit state guarantees of bank liabilities contribute to incentives for banks to create risk. In particular, Merton (1977) shows that with a risk-insensitive deposit insurance premium, bank shareholders potentially enjoy a subsidy that increases in value with bank leverage and asset risk.

income shock in order to remain in business, and perhaps are forced to scale back payouts by regulators.

Complementary to our analysis of corporate governance, we consider how banks' capitalization strategies vary with executive compensation. We distinguish between the overall compensation, as measured by total annual compensation and the value of options and shares that have been awarded, and the incentive to take risk as embedded in compensation packages.

We find a positive relationship between bank capitalization and the value of options and shares that have been granted to the CEO. This may reflect that these options and shares frequently represent a significant but non-diversifiable part of the CEO's financial wealth, providing incentives to reduce rather than increase bank risk when the CEO is risk averse.

For a sample of US banks, we are able to more precisely measure the CEO's risk-taking incentives embedded implicitly in his portfolio of options and shares invested in his own bank. For these banks, we find that bank capitalization is negatively related to the CEOs' incentives to take risk as embedded in their financial portfolios.

We also find that high levels of CEO annual compensation, and ownership of options and shares are associated with a tendency for banks to continue payouts to shareholders, even if the bank performs poorly. One explanation is that executives fear that payout cuts could endanger their jobs or wealth, as the bank' share price may drop on the news of lower payouts to shareholder.

Several theoretical and empirical papers consider how corporate governance affects banks.[3] On the theory side, Bolton, Mehran and Shapiro (2015) show that excess risk taking by banks can be addressed by basing executive compensation on both the stock price and the bank's CDS spread. The presence of deposit insurance and trusting debt holders, however,

[3] Becht, Bolton, and Roell (2011) and Mehran, Morrison and Shapiro (2012) survey the literature.

imply that it is not in shareholders' interests to design compensation contracts in this way. Edmans and Liu (2011) show that debt-like instruments such as pension rights are generally part of the optimal executive compensation package so as to reduce the agency costs of debt. John, Saunders and Senbet (2000) demonstrate that the FDIC insurance premium can be made dependent on incentive features of top-management compensation to eliminate excess bank risk taking.

Existing empirical papers primarily focus on two main issues: (i) the impact of corporate governance on ex ante risk taking by banks, and (ii) the implications of corporate governance on how banks fared during the crisis.

Regarding the first question, Pathan (2009) finds that small boards and boards not controlled by the CEO lead to additional bank risk as reflected in market measures of risk and the Z-score for a sample of US bank holding companies over the 1997-2004 period. Chen, Steiner, and Whyte (2006) find a positive impact of option-based executive compensation on market measures of risk for a sample of US commercial banks during the period 1992-2000. DeYoung, Peng, and Yan (2013) further find that CEO risk-taking incentives led to riskier business policy decisions (concerning loans to businesses, non-interest income based banking activities, and investments in mortgage-backed securities) at US commercial banks over the 1994-2006 period.

Regarding the second issue, Berger, Imbierowicz, and Rauch (2012) find that high shareholdings of outside directors and chief officers imply a substantially lower probability of bank failure for US commercial banks over the 2007-2010 period. Fahlenbrach and Stulz (2011) find some evidence that US banks with CEOs whose incentives were better aligned with the interests of shareholders in 2006 had a worse share price performance during the subsequent crisis. Ellul and Yerramilli (2013) report that US bank holding companies that

had strong internal risk controls in place before the onset of the financial crisis fared better in terms of operating and stock performance during the crisis.

Several empirical papers have considered capitalization rates of banks (Gropp and Heider, 2010; Keen and De Mooij, 2015), and the speed of adjustment towards a desired capitalization rate (De Jonghe and Oztekin, 2015,) using international data. However, these papers have not considered corporate governance issues.

Finally, our study is also related to a significant literature that examines how corporate governance affects corporate payout policy without looking specifically at financial firms or the crisis period. Fenn and Liang (2001), for instance, find that managers that own stock options are more likely to initiate share repurchases rather than pay dividends, as these tend to lead to better share price performance. Along similar lines, Brown, Liang and Weisbenner (2007) find that the 2003 US dividend tax cut led to higher dividend payments relative to share repurchases in firms where executives had significant stock ownership. La Porta et al. (2000) find that firms pay higher dividends if located in countries with stronger minority shareholder rights. More general analyses of the evolution of dividends and share repurchases in the US and in Europe are offered by Jagannathan, Stephens, and Weisbach (2000), and Von Eije and Megginson (2008).

In the remainder, section 2 develops our hypotheses regarding the relationships between corporate governance structures and executive compensation schemes on the one hand and bank capitalization strategies on the other. Section 3 discusses the data. Section 4 presents the empirical results. This section starts with an analysis of how capitalization rates vary with corporate governance and executive compensation. Subsequently, it considers payouts to bank shareholders with a focus on underperforming banks. Finally, section 5 concludes.

2. Hypotheses

Banks tend to have a fair amount of discretion to choose their corporate governance structures within the legal frameworks of their countries of location. Hence, banks' corporate governance structures reflect a combination of national legal requirements and the preferences of banks' key stakeholders, and in particular their shareholders.[4] The relationship between bank corporate governance and bank capitalization can reflect an impact of the legal system on corporate governance, which then affects capitalization strategies. Alternatively, shareholder preferences can jointly determine bank corporate governance and bank capitalization.

By either chain of causation, shareholder-friendly corporate governance features should vary positively with risky bank capitalization strategies. Shareholder-friendly corporate governance features as determined by the legal system, in particular, can be expected to lead to low bank capitalization, as this increases bank valuation by shifting risk towards a combination of the bank's creditors and the financial safety net. Alternatively, more shareholder influence over the bank can jointly give rise to shareholder-friendly corporate governance and share value-enhancing low bank capitalization.

In the empirical section, we provide evidence on our main hypothesis that shareholder-friendly corporate governance varies negatively with bank capitalization, without establishing the exact chain of causation. We consider three main aspects of corporate governance: board independence, board size, and anti-takeover provisions. These three governance aspects give rise to specific hypotheses that next are motivated and described in turn.

[4] Doidge, Karlolyi and Stulz (2007) find that country characteristics are more important in explaining firm-level variation in governance ratings than observable firm characteristics. Unobservable firm characteristics such as shareholder preferences, however, may be important in shaping governance structures.

A more independent board is less likely to be captured by management and is likely to better represent the interests of shareholders rather than of management. Therefore, we hypothesize that a more independent board favors more risk taking, resulting in lower bank capitalization. Separation of the roles of CEO and chairman of the board may also enable a board to better promote the interests of shareholders, giving rise to lower bank capitalization.

Hypothesis 1 (board independence): Banks with more independent boards and with boards not chaired by the CEO have lower capitalization.

Regarding board size, a very small board may not be very effective in controlling management, as the burden of effective oversight would fall on very few board members. A very large board may similarly not be very effective, as it could be subject to free-rider problems among its many members, reducing their incentive to acquire information and monitor managers.[5] This suggests that a larger board may be either better or worse at promoting shareholder interests, giving rise to either lower or higher bank capitalization. More specifically, boards of intermediate size may be best at promoting shareholder interests, giving rise to lowest bank capitalization.

Hypothesis 2 (board size): Larger boards may be associated with lower or higher bank capitalization, while boards of intermediate size are associated with lowest bank capitalization.

Anti-takeover provisions could weaken the disciplining effect of the market for corporate control on bank management. As a result, these provisions could enable bank managers to adopt higher bank capitalization in an effort to make the bank less risky and their own jobs more secure, to the detriment of bank shareholders. As evidence along these lines, Low (2009) finds that an increase in anti-takeover protection in Delaware in the mid-1990s caused managers to lower firm risk.

[5] Yermack (1996) finds an inverse relationship between board size and firm performance.

Hypothesis 3 (anti-takeover provisions): Banks protected by anti-takeover provisions have higher capitalization.

In addition to corporate governance, we consider how bank capitalization varies with executive compensation. The relationship between overall executive compensation and bank risk taking is a priori uncertain. Stock and option grants can align the incentives of managers with those of shareholders, and therefore encourage risk taking. The risk incentives per se that are embedded in the shares and options that have been granted to an executive should induce higher risk taking, leading to lower capitalization.[6] However, significant executive annual income and non-diversifiable financial wealth tied to a bank also provide executives with incentives to take less risk, leading to higher bank capitalization.

An empirical literature examines two indices that summarize the risk-taking incentives implicit in equity-based executive compensation.[7] First, 'delta' measures the sensitivity of the value of executive compensation to the stock price. Higher delta exposes managers to more risk, which discourages risk taking. Second, 'vega' measures the sensitivity of the value of executive compensation to the stock return volatility. Higher vega therefore encourages risk taking.[8]

Hypothesis 4 (executive compensation): While the relationship between overall executive compensation and bank capitalization can be ambiguous, higher risk incentives embedded in executive compensation should be negatively related with bank capitalization.

We have information on CEO total annual compensation, share ownership, and the total fair value of options granted to the CEO for an international sample of banks, but information on delta and vega only for a sample of US banks.

In addition to bank capitalization, we consider how corporate governance and executive

[6] DeYoung et al. (2013) find that greater risk-taking incentives are embedded in the compensation packages of bank executives.
[7] See, for instance, Carpenter (2000) and Lambert, Larcker, and Verrecchia (1991).
[8] See, for instance, Knopf, Nam, and Thornton (2002) and Coles, Daniel, and Naveen (2006).

compensation vary with a bank's tendencies to continue to make payouts to bank shareholders in the form of dividends and share repurchases after experiencing a major negative income shock. The continuation of payouts following a negative income stock is a risky strategy that increases the risk of bank distress. Continued payouts may serve the interests of bank shareholders as it leads to lower bank capitalization. Therefore, we hypothesize that aspects of corporate governance and executive compensation that are associated with lower bank capitalization are also associated with continued payouts to shareholders subsequent to major negative income shocks.

3. The data

We combine data on banks' capitalization ratios and payout behavior for an international sample of banks with data on key aspects of their corporate governance and executive compensation schemes. Accounting data and market data necessary to construct our capitalization and payout variables are from Bankscope of Bureau Van Dijk and Worldscope of Thomson Financial. All accounting data are from banks' consolidated financial statements. Data on corporate governance features for an international sample of banks for the years 2003-2007 are from the Corporate Governance Quotient (CGQ) database assembled by Institutional Shareholder Services.[9] Data on executive compensation for banks internationally for the years 2002-2010 are from Compustat's Capital IQ. Finally, data on additional compensation variables only for US banks for the 2002-2010 period are available from Compustat's ExecuComp. Table A1 in the Appendix provides variable definitions and data sources, and Table A2 reports country coverage.

[9] The database covers companies in 25 developed countries. Specifically, it covers US firms in the S&P 400, S&P 500, S&P 600, and Russell 3000 indices, Canadian firms in the S&P/TSX Composite Index, and the top 500 UK companies by market capitalization. For all other countries, the database covers the MSCI/EAFE index and the FTSE All World Developed Index.

We consider the impact of corporate governance and of executive compensation on five alternative indices of bank capitalization. First, Tier 1 capital is a regulatory capital ratio constructed as Tier 1 capital divided by risk-weighted assets, where Tier 1 capital and risk-weighted capital are calculated according to Basel rules. Tier 1 capital includes common equity and perpetual, non-cumulative preferred equity, and it can be seen as a measure of the funds cumulatively contributed by common and preferred shareholders that can be exhausted through losses while the bank remains a going concern. As seen in Table 1, the mean Tier 1 capital ratio in our sample is 11.9%.

Total capital is a broader regulatory capital ratio constructed as the sum of Tier 1 capital and Tier 2 capital divided by risk-weighted assets. Tier 2 capital includes hybrid capital, subordinated debt, loan loss reserves, and valuation reserves. Subordinated debt can only be used to offset a bank's losses, after the bank has ceased to be a going concern. Thus, not all of Tier 2 capital can be considered to be a buffer to protect a bank from insolvency. The average Total capital ratio is 13.7%.

Common equity is a narrower measure of bank capitalization constructed as common equity divided by total assets. This capitalization measure should be relevant to common shareholders, as it represents the capital that common shareholders have at stake. Common shareholder interests should be important to a bank's management and board, because common shareholders have voting rights. The denominator of the common equity ratio is total assets rather than risk-weighted assets, and hence insensitive to the potentially arbitrary and manipulable risk weighting of assets. The mean common equity ratio is 8.9%.

Common equity can be divided into tangible common equity and non-tangible common equity. The latter includes tax deferred assets, mortgage servicing rights, and minority interests in financial intermediaries. The loss absorption capacity of these various items is zero (as in the case of tax deferred assets) or limited (as in the case of mortgage

servicing rights). Therefore, we also consider the Tangible equity ratio, constructed as tangible capital divided by tangible assets (i.e., total assets minus non-tangible assets). The Tangible capital ratio has a mean of 7.9%.

Banks have some discretion over the book valuation of their assets and their capital. For this reason, capitalization measures based solely on accounting data may be misguided, especially during a time of economic and financial crisis. Therefore, we consider an additional capitalization measure, denoted by Market value, that is constructed as the ratio of the market value of the bank's common equity to a proxy for the market value of a bank's total assets, computed as the sum of the book value of total assets and the market value of common equity minus the book value of common equity. This market-based measure of bank capitalization should be more accurate than corresponding accounting-based measures to the extent that bank stock investors are aware of distortions in the accounting valuation of bank assets. However, the market-based capital ratio can only be an imperfect measure of bank capitalization, as it also reflects the valuation of a bank's access to the financial safety net. Banks that are too big to fail, in particular, may have a higher market valuation than justified purely on the basis of extant bank capital, as they can count on being bailed out in case of financial distress. The average Market value ratio is 12.2%.

Figures 1 through 5 provide information on the development of our five bank capitalization measures over the 2003-2011 period. Figures 1 and 2 show that the two regulatory capital measures, Tier 1 capital and Total capital, declined from 2004 to 2008, followed by significant increases afterwards to levels even higher than before the crisis. Figures 3 and 4 show that the Common equity ratio and the Tangible capital ratio declined during the crisis till 2009 and 2008, respectively, with modest subsequent recoveries. Together these four pictures suggest that the increases in the regulatory ratios during 2009-

2011 reflect a downward adjustment of the average risk-weighting of assets in addition to a decline in the leverage ratios based on common equity and tangible capital.

Figure 5, in turn, provides the time trend of the Market value ratio. Interestingly, the time paths of the Common equity ratio in Figure 3 and the Market value ratio in Figure 5 look very similar until 2010, while they diverged in 2011. The uptick in the Common equity ratio in 2011 is not followed by a corresponding increase in the Market value ratio. This suggests that changes in the Common equity ratio corresponded rather well with shareholders' perception of bank market value changes until 2010, but not in 2011. The discrepancy between Figures 1 and 2 on the one hand and Figure 5 on the other further suggests that the strong recoveries of the regulatory capital ratios as seen in Figures 1 and 2 after 2008 are likely to be purely accounting-based, as there is no corresponding strong recovery in the Market value ratio.

Together, the five capital ratios considered in this paper reflect the chance of bank insolvency as well as the potential shortfall of bank capital in case of insolvency. The common equity ratio and the intangible capital ratio are indices of the loss-absorbing, economic capital that a bank has available to ward of insolvency. These capital ratios, however, do not take into account the riskiness of bank assets unlike the regulatory capital ratios, i.e. the Tier 1 capital ratio and the Total capital ratio. Beyond these accounting-based capital ratios, the Market capital ratio has the advantage of reflecting market perceptions of any misrepresentation of bank capital in the accounting data.

We also consider four measures of payouts to bank shareholders: (i) dividends, (ii) share repurchases, (iii) the sum of dividends and share repurchases, denoted by total payout, and (iv) the sum of dividends and share repurchases minus share issuance to private

shareholders, denoted by net payout.[10] Corresponding to these four payout measures, we construct four dummy variables indicating whether or not a particular payout measure is positive. The Dividends dummy variable, for instance, denotes whether or not a bank pays dividends. As seen in Table 1, 83.9% of banks pay dividends on average; 58.4% of banks repurchase shares; 88.6% have a positive total payout; and 75.8% have a positive net payout.

In addition, we consider four payout variables reflecting the funds returned to shareholders relative to total assets. The Dividends to assets variable is the ratio of dividends to total assets with a mean of 0.34%. The Repurchases to assets ratio has a mean of 0.25%. The mean Total payout to assets ratio is 0.60%, while the mean Net payout to assets ratio is 0.48% where this variable is truncated at zero.

Figures 6-9 display the time trends of the four payout variables as ratios of total assets over the 2003-2011 period. The Dividends to assets ratio increased until 2006, and declined strongly afterwards, with a modest recovery in 2011. The Repurchases to assets ratio, in turn, peaked in 2007, declined in 2008, and then stayed relatively low during 2009-2010 to increase again in 2011. The Total payout to assets ratio also peaked in 2007, followed by a decline until 2010 and a recovery in 2011. Finally, the Net payout to assets ratio, peaked in 2007, and then declined until 2009, to increase again in 2010 and 2011.

Our corporate governance variables relate to board independence, board size and anti-takeover provisions. To start, Board independence is an indicator of the share of independent directors in the board; this variable ranges from 1 to 6, with a higher score indicating a higher share of independent directors (see Table A1 in the Appendix for further details on how this and other corporate governance variables are constructed). As a related matter, the CEO

[10] The total payout variable abstracts from the choice between dividends and repurchases. Jagannathan, Stephens, and Weisbach (2000) find that dividends are paid by firms with 'permanent' operating cash flows, while repurchases are used by firms with 'temporary', non-operating cash flows. See Denis and Osobov (2008) and Von Eije and Megginson (2008) for analyses of which firms pay dividends and repurchase shares using international data.

chairman separation variable indicates the degree to which the roles of CEO and chairman of the board are separated; the CEO chairman separation variable ranges from 1 to 3, with a higher score indicating better separation between the two roles.

Board size is an indicator of the number of board members; this variable ranges from 1 to 5, with a higher score representing a larger board. Further, the Board size, effective variable takes a higher value if the headcount of board members is taken to imply a board that more effectively represents shareholder interests; this variable ranges from 1 to 3, with a higher score representing a more effective board. The highest score of 3 is given to a board with an intermediate number of board members in the 9 to 12 range.

As a final corporate governance variable, the Anti-takeover provision variable is a dummy variable that equals one if the bank is incorporated in a state (for U.S. banks) or a country (for non-U.S. banks) that enables anti-takeover provisions, and if the bank has indeed implemented such a provision.

We consider several executive compensation variables related to the CEO's overall yearly compensation and the options and shares that have been granted. For an international sample of banks, we have information on CEO overall annual compensation packages and on the executive's ownership of options and shares from Capital IQ. To start, CEO total compensation is defined as the logarithm of overall annual compensation granted to the CEO. This variable represents options and shares granted as well as cash compensation. In addition, we construct three variables that represent the significance of executive option and share ownership normalized by annual cash compensation. First, CEO options is the logarithm of the value of options cumulatively granted to the CEO normalized by the current cash compensation. Second, CEO shares is the logarithm of the value of the shares cumulatively granted to the CEO normalized by the cash compensation. Third, combining these two, CEO

portfolio is the logarithm of the total value of the CEO's options and shares normalized by the cash compensation.

The valuation data on executive option and shares wealth available from Capital IQ do not include details on exactly what options or shares are held. Hence, this information is too crude to compute executive risk taking incentives beyond those implicit in overall valuations. For US banks, more detailed information about executive option and stock packages is available from ExecuComp. For US banks only, therefore, we can measure executive risk taking incentives more precisely, as proxied by variables that indicate the impact of share price movements and increases in share price volatility on executive wealth. The CEO delta variable, in particular, is the logarithm of the CEO's delta, defined as the dollar value change of the CEO's stock and option portfolio if the stock price increases by 1%. A high CEO delta suggests that the CEO has a lot of wealth at stake in the bank, and hence that the CEO will be inclined to take on less risk. Further, CEO vega stands for the logarithm of the CEO's vega, defined as the dollar value change of a CEO's stock and option portfolio if the stock price volatility increases by 1%. A high CEO vega indicates that the CEO's wealth increases considerably with increased share price volatility, and hence it suggests that the CEO will be inclined to take on more risk.

In our capitalization regressions, we use three bank-level control variables. First, Assets is the log of a bank's total assets. Larger banks are expected to maintain lower capitalization rates, acting on their incentive to exploit their too-big-to-fail status. Second, Return on assets is a bank's pre-tax profits divided by total assets. More profitable banks should be able to maintain higher capital ratios, as they can more easily add to their capital buffers by retaining earnings (and not taking losses). Finally, Ownership is a dummy variable

that equals one if a single owner has direct ownership of more than 10% of the bank.[11] Concentrated ownership is expected to be associated with lower capitalization rates in line with evidence in Laeven and Levine (2009) that bank risk taking varies positively with the power of shareholders.

Finally, to proxy for negative bank income shocks, we define the Income shock variable as the negative of the change in a bank's return on assets if it is in the lowest quintile of the change in the rate of return on assets distribution. The Income shock variable is set to zero, if the change in the rate of return on assets is in the upper four quintiles of its distribution. The mean Income shock is 1.7%. Figure 10 shows the fraction of banks experiencing negative income shocks in any given year. The highest fraction of banks experiencing negative income shocks is seen during the crisis year 2008.

4. Empirical results

This section presents empirical results on how corporate governance and executive compensation vary with bank capitalization strategies. Subsection 4.1 focuses on bank capitalization ratios, while subsection 4.2 considers payouts of badly performing banks to bank stock investors.

4.1 Results on bank capitalization

Table 2 shows the results of regressions that relate bank capitalization ratios to corporate governance variables for an international sample of banks over the 2004-2008 period.[12] All explanatory variables are lagged one period to reduce the potential for reverse

[11]The 10% ownership threshold corresponds to the ownership threshold in the US definition of FDI. If ownership is recorded for less than 90% of the shares, we assume that this reflects dispersed ownership rather than missing information on major shareholders. We consider only publicly listed banks, and major shareholders with more than 10% ownership are likely to be recorded because of disclosure requirements imposed by stock exchanges.

[12] The sample period includes the pre-crisis years 2004-2006 and the crisis years 2007-2008, which implies that the regressions inform about the association between bank capitalization and corporate governance over a period that includes crisis as well as non-crisis years.

causation. Regressions include country-year fixed effects to control for time-varying, country-level determinants of capitalization rates such as the state of the business cycle. Standard errors are adjusted for clustering at the bank level.

Panel A shows the results of five capitalization regressions that include the board independence variable.[13] This variable enters regressions for the four capitalization ratios based on accounting information (i.e., tier 1 capital, total capital, common equity, and tangible capital) in columns 1-4 with negative and insignificant coefficients, while it enters the market value regression in column 5 with a positive coefficient that is significant at 10%. The positive estimated coefficient in column 5 could reflect that bank capitalization varies positively with board independence (contrary to Hypothesis 1), or alternatively that banks with more independent boards are higher valued, for instance because they have a more valuable contingent claim on the financial safety net achieved by riskier bank capitalization strategies.

In Panel B, the CEO chairman separation variable has a negative coefficient that is significant at the 10% level in the tangible capital regression 4, providing some evidence that a board that is not dominated by the CEO pursues a low-capitalization strategy in the interests of shareholders (in line with Hypothesis 1).

In Panel C, the board size variable enters the total capital regression in column 2 with a negative coefficient that is significant at the 10% level, suggesting that board size varies negatively with bank capitalization. The board size variable, however, enters the common equity regression in column 3 and the market value regression in column 5 with positive coefficients that are significant at 10% and 5%, respectively. Hence, we cannot

[13] In regression 4 of Panel A, tangible capital is positively and significantly related to the ownership variable. In contrast, the ownership variable obtains negative and significant coefficients in regressions 1-4 of Table 5 for a sample of US firms. Hence, we do not find robust evidence on the relationship between ownership concentration and bank capitalization.

unambiguously establish how board size correlates with bank capitalization (as suggested by Hypothesis 2).

In Panel D, the board size, effective variable enters the common equity and tangible capital regressions in columns 3 and 4 with negative coefficients that are significant at the 1% level. Thus, boards of intermediate size are associated with lower capital ratios relative to un-weighted assets (in accordance with Hypothesis 2), while they are not materially related to regulatory capital ratios relative to weighted assets in columns 1 and 2. These results together suggest that banks with an 'effective' board size are more leveraged, and that they invest in assets with low or no risk weightings such as government bonds to keep their regulatory capital ratios at high levels.

Finally, in Panel E the anti-takeover provision variable obtains positive and significant coefficients in columns 1-3 (in line with Hypothesis 3), while it has a negative and significant coefficient in the market value regression in column 5. Anti-takeover protection may enable management to pursue high-capitalization strategies as reflected in accounting-based capital ratios so as to make their jobs and wealth invested in the firm safer. The negative association between anti-takeover protection and market-based capitalization may reflect that managers create more shareholder value in the absence of anti-takeover provisions, either by influencing capitalization rates or in other ways.[14]

Overall, the evidence of Table 2 suggests that separation of the CEO and chairman roles, boards of intermediate size, and an absence of anti-takeover provisions are associated with lower accounting-based capitalization ratios, while a more independent board, a larger board and a lack of anti-takeover provisions are associated with a higher market-based capitalization.[15] Shareholder-friendly corporate governance may correlate positively with

[14] In a robustness check, we include the square of the (logarithm of) assets variable in the regressions of Table 2. In the total capital regression 2 of Panel C, the board size variable then is no longer significant (unreported).
[15] As seen in Table A2 in the Appendix, the sample represents in large part US banks. For both the US and non-US subsamples, we obtain results that are qualitatively similar to Table 2, with the exception that the positive

market-based capitalization on account of a real capitalization channel or any other channel by which shareholder-friendly corporate governance is positively related to bank valuation.

As discussed in section 2, a negative association between shareholder-friendly corporate governance and bank capitalization could reflect shareholder interests to bring about low bank capitalization in order to shift risk to bank creditors and the financial safety net. A bank's incentive to shift risk should be especially strong, if the bank is located in a country with sound public finances that can afford to bail out a bank that experiences distress.[16] This suggests that bank capitalization should be especially low for banks with shareholder-friendly corporate governance that are located in countries with sound public finances. To test this, we include interaction terms of the corporate governance variables with the fiscal balance variable to proxy for a country's fiscal strength in the regressions reported in Table 2. A negative estimated coefficient for such an interaction term, in the case of indices of shareholder-friendly corporate governance, is evidence that shareholder-friendly corporate governance is associated with low capitalization especially for banks located in countries with strong public finances, consistent with an explanation of this relationship based on risk-shifting incentives facing shareholders.

The interaction term involving the board independence variable is negatively and significantly related to the common equity ratio in regression 3, and the tangible capital ratio in regression 4 in Panel A of Table 3, consistent with a risk-shifting explanation. Similarly, in Panel B the CEO chairman separation interaction variable is negative and significant in the regulatory capital ratio regressions 1 and 2, consistent with risk-shifting incentives. In the

and significant relationship between the anti-takeover provision variable and capitalization rates in Panel E of Table 2 is reversed for the much smaller non-US sample (unreported).

[16]Acharya, Drechsler, and Schnabl (2014) find that an increase in the sovereign CDS spread is associated with an increase in the level of bank CDS spreads in Europe after bank bail-outs in 2008, while Demirguc-Kunt and Huizinga (2013) find that bank CDS spreads appear to decrease with the fiscal balance for an international sample of banks during the 2001-2008 period. These results are consistent with the view that stronger government finances increase the value of government guarantees of bank liabilities.

Tier 1 capital regression 1 of Panel C, the interaction of board size with the fiscal balance enters positively and significantly. This would be consistent with risk shifting by way of a low capitalization rate in the interests of shareholders especially in countries with sound public finances, if smaller boards better represent shareholder interests. Finally, in the total capital regression 2 of Panel E, the interaction of the anti-takeover provision and fiscal balance variables obtains a negative and significant coefficient, which is evidence against the hypothesis that banks with shareholder-friendly corporate governance reduce their capitalization especially if located in countries with sound public finances. Overall, we find some evidence that banks with shareholder-friendly corporate governance (in the form of independent boards, and a separation of the chairman and CEO roles) have lower capitalization especially in countries with sound public finances consistent with a risk-shifting explanation, but this evidence is inconclusive.

Next, Table 4 shows results of capitalization regressions that include executive compensation variables analogous to those in Table 2. The five regressions in Panel A that include the CEO total compensation variable yield insignificant coefficients for this variable, perhaps reflecting that the various components of total compensation can affect capital ratios in opposite directions.

In Panel B the CEO options variable obtains a positive and significant coefficient in the market value regression in column 5.[17] This could mean that CEOs with significant option wealth choose high market-based capitalization rates to reduce risk to their wealth (see Hypothesis 4), or alternatively that high CEO option wealth is associated with other value enhancing changes in bank outcomes.

[17] Previously Houston and James (1995) found positive relationships between equity-based measures of CEO compensation and a bank's market-to-book value taken to be consistent with the hypothesis that such compensation promotes risk taking in banking.

The CEO shares variable enters the capitalization regressions in columns 1-4 of Panel C with positive coefficients that are statistically significant. CEOs with significant CEO stock wealth appear to choose higher capitalization rates so as to safeguard their wealth (see Hypothesis 4). Similarly, in Panel D we find that the CEO portfolio variable, representing both option and stock wealth, obtains positive and significant coefficients in columns 1 and 3-5. Overall these results are consistent with the view that CEOs with significant option and stock wealth invested in a bank choose higher capitalization rates to safeguard their wealth.[18]

Next, we consider capitalization regressions that include information on executive risk-taking incentives, as summarized by CEO delta and CEO vega, for US banks only. A higher CEO delta suggests that executive wealth is more sensitive to bank share price movements, which could reduce bank risk-taking in the form of low capitalization rates. In contrast, CEO vega measures the increase in executive wealth following a higher share price volatility. CEO vega should be a good proxy for an executive's incentive to take on more risk, and is expected to be associated with lower capital ratios.

In Table 5, CEO delta is estimated with positive and significant coefficients in the tangible capital and market value regressions 4 and 5, suggesting that a CEO with significant wealth invested in his bank subject to share price risk increases its capitalization.[19] The CEO vega variable receives negative and significant coefficients in the same two regressions, consistent with the view that the CEO acts on his incentive to create share price volatility by

[18] We also considered the impact of CFO compensation on bank capitalization rates finding similar results. Specifically, we do not find that capitalization rates are significantly related to CFO total compensation, while in some specifications they are positively and significantly related to CFO option wealth, CFO shares wealth, and to the sum of these (unreported).

[19] Chava and Purnanandam (2010) have studied the impact of executive risk-taking incentives on corporate policies for US firms generally finding that risk-decreasing incentives facing the CEO are associated with lower leverage.

lowering capitalization ratios (consistent with Hypothesis 4). Overall, bank capitalization appears to reflect bank risk-taking incentives as summarized by CEO delta and CEO vega.[20]

Taken together, the results in Tables 4 and 5 suggest that the *level* of CEO overall compensation in the form of option and stock ownership varies negatively with risk-taking (giving rise to higher bank capitalization), while risk-taking incentives embodied in executive compensation contracts, as properly measured by CEO vega, are positively associated with bank risk (giving rise to lower bank capitalization). The apparent failure of the level of executive option and stock ownership to correlate positively with bank risk-taking may reflect the executive's inability to diversity his financial capital tied to his bank. This inability implies that in many cases the executive will have a large share of his overall personal wealth linked to his bank, which discourages risk-taking through low bank capitalization.

4.2 **Results on payouts to bank stock investors**

In this subsection, we consider how corporate governance and executive compensation vary with a bank's decision whether or not to continue payouts to shareholders in the face of negative income shocks.[21] We consider four alternative measures of payments to shareholders: dividends, share repurchases, total payout which is the sum of dividends and repurchases, and net payout defined as dividends and share repurchases minus share issuance to investors. In the regressions, we examine four dummy variables denoting whether the corresponding payout measure is positive, and alternatively four variables calculated as the payout measure divided by the bank's total assets. To proxy for negative bank income shocks, we define the income shock variable as the negative of the change in a bank's return

[20] In analogous regressions, we do not find that bank capitalization rates are significantly related to CFO delta or CFO vega, which suggests that the CEO is more influential in determining bank capitalization rates than the CFO (unreported).

[21] A bank that is slow to reduce payments to shareholders in the face of negative income shocks can only slowly adjust its capital ratios towards target levels provided that it does not fail. See Byoun (2008), Huang and Ritter (2009), and Oztekin and Flannery (2012) for empirical analyses of how firms dynamically adjust their capital structures towards targets.

on assets if it is in the lowest quintile of the change in the return on assets distribution, while this variable is set to zero otherwise.

The regressions include an interaction term of the income shock variable with a particular corporate governance or executive compensation feature. A positive estimated coefficient for such an interaction term implies that the included corporate governance or executive compensation variable is associated with continued payouts to shareholders after a negative income shock has occurred, as evidence of a risky payout strategy.

We estimate probit models to explain variation in the payout dummy variables, while we use tobit models to explain (truncated) payouts relative to assets. Both probit and tobit models include country-year fixed effects. Standard errors are adjusted for clustering at the bank level.

Table 6 reports the results of the payout regressions that include corporate governance features. In the repurchases dummy regression 2 and the repurchases to assets regression 6 of Panel B, the interaction of the CEO chairman separation and the income shock variables enters with negative and significant coefficients, suggesting that banks with a better separation of the CEO and chairman roles tend to reduce or cease payouts to shareholders after experiencing a negative income shock. This is evidence that banks with shareholder-friendly corporate governance tend to lower payouts to shareholders after a bank has made significant losses.

In the dividends, repurchases and net payout dummy regressions 1-2 and 4 and the dividends to assets and repurchases to assets regressions 5-6 of Panel C, the interaction term of the board size and income shock variables obtains positive and significant coefficients. Banks with larger boards thus tend to continue payouts to shareholders after experiencing a material negative income shock. This would be evidence that banks with shareholder-friendly

corporate governance scale back payouts to shareholders after a negative income shock if small boards better represent shareholder interests, and vice versa.

In the dividends, repurchases and net payout dummy regression 1-2 and 4 of Panel D, the interaction of the board size, effective and income shock variables is estimated with negative and significant coefficients. This suggests that banks with shareholder-friendly corporate governance, in the form of boards of intermediate size, decrease payouts to shareholders following a large negative income shock.

Overall, evidence from Panels B and D (including the CEO chairman separation and board size, effective variables) indicates that banks with shareholder-friendly corporate governance tend to reduce payouts to shareholders in the face of a large negative income shock. This evidence appears contrary to the results in Table 2, indicating that shareholder-friendly corporate governance varies negatively with accounting-based bank capitalization rates. However, it should be noted that banks with relatively shareholder-friendly corporate governance that already maintain low capitalization rates before a negative income shock hits, are more likely to need to stop payouts to shareholders when the shock occurs in order to save the bank. The evidence of this section shows that banks in this situation indeed reduce payouts to shareholders. This could be because of these banks' own volition or because they are forced to do this by regulators.

Next, in Table 7 we consider how the payouts to shareholders of badly performing banks are related to executive compensation. Starting with CEO total compensation in Panel A, we see that the interaction of this variable with the income shock variable obtains positive and significant coefficients in the dividends, total payout, and net payout dummy regressions in columns 1, 3 and 4, suggesting that CEOs with high total annual compensation keep up payouts to shareholders in the face of negative income shocks. The interaction of the CEO options variable with the income shock variable, in turn, is positively and significantly related

to the dividends, and total payout dummy variables in regressions 1 and 3, and to the dividends to assets, total payout to assets, and net payout to assets variables in regressions 5, 7, and 8 of Panel B. A CEO with considerable option wealth may favor keeping up payouts to shareholders, as lower payouts could be interpreted as negative news by investors, potentially causing a decline in option valuation.

In Panel C, we see that the interaction of the CEO shares variable with the income shock variable is estimated with a positive and significant coefficient in the total payout dummy regression 3. Similarly, the interaction of the CEO portfolio variable and the income shock variable receives coefficients that are positive and significant in the total payout and net payout dummy regressions 3-4 in Panel D. Overall, these results suggest that considerable CEO wealth invested in a bank is associated with continued payouts to shareholders in the face of negative income shocks.

Combining the findings from Tables 4 and 7, we see that higher CEO wealth invested in the bank is associated with higher capitalization rates and also with the maintenance of payouts to investors after negative income shocks. These two aspects of higher CEO wealth invested in the bank have apparent opposite implications for bank risk. However, these various findings can to some extent be reconciled by noting that a badly performing, but well capitalized bank may be able to maintain payouts to investors for some time without being ordered to stop doing this by regulators.

5. Conclusion

For an international sample of banks over the 2003-2011 period, we find that 'good' corporate governance – or corporate governance that favors the interests of bank shareholders – is associated with lower levels of bank capital. Specifically, we find that CEO chairman separation, intermediate board size, and an absence of anti-takeover provisions are related

negatively to accounting-based capitalization rates. Shareholder interests may be served by low capitalization, as this implies that bank risk, to some extent, is shifted to the bank's creditors or to the financial safety net.

The negative association between 'good' corporate governance and bank capitalization suggests that 'good' corporate governance may correlate positively with bank instability. This potential disadvantage of 'good' corporate governance is in contrast to possible benefits of shareholder-friendly corporate governance in terms of restricting management's ability to underperform more generally – for instance, by shirking or acquiring perks – at the expense of bank shareholders.

We find evidence indicating that banks with 'good' corporate governance tend to scale back payouts to shareholders after experiencing a negative income shock. This may be because banks with 'good' corporate governance on average have relatively low capitalization rates, providing them with little room to maintain relatively aggressive payout policies when faced with negative income shocks.

Further, we find that bank capitalization rates increase with CEO share and option ownership normalized by annual cash compensation consistent with the notion that non-diversifiable financial wealth tied to a bank may provide executives with incentives to take less risk, leading to higher bank capitalization rates. For a sample of US banks, we find that bank capitalization is negatively related to the CEO's incentives to take risk as embedded in his financial wealth linked to the bank.

A higher level of executive option and stock ownership in the bank is associated with a higher tendency for the bank to continue payouts to bank stock investors even if the bank performs poorly, suggesting that higher executive wealth invested in the bank is associated with riskier payout strategies. This may be because executives fear that payout cuts could endanger their jobs or wealth as the share price may drop on the news of lower payouts to

shareholders, with these risks becoming more pronounced at higher levels of wealth tied to the bank.

While we cannot establish a causal link from 'good' corporate governance to low bank capitalization, our results are suggestive that policies that promote 'good' corporate governance at banks could lead to lower bank capitalization and hence increased bank instability. In reform discussions since the crisis, the potentially nefarious impact of 'good' governance on bank risk-taking often fails to be recognized.[22] The European Commission (2010, p. 6), for instance, states that the board of directors were unable to exercise effective control over senior management and that directors' failure to identify, understand and ultimately control the risks to which their financial institutions were exposed was at the heart of the origins of the crisis.

The UK Parliamentary Commission on Banking Standards (2013, p. 40 and p. 42) similarly concludes that many non-executive directors failed to act as an effective check on, and challenge to, executive managers, recommending the appointment of a Senior Independent Director ensuring that the relationship between the CEO and the Chairman does not become too close and that the Chairman performs his or her leadership and challenge role. This proposed change in the corporate governance of banks potentially increases bank risk-taking as long as boards act on the principle of shareholder primacy in line with section 172 of the Companies Act of 2006. However, the UK Parliamentary Commission (2013, p. 42) simultaneously recommends to remove shareholder primacy with respect to banks,

[22] In addition, in specific cases bank supervisors move to bring about 'good' governance at a bank, with possibly opposite consequences for bank risk from the ones that were intended. In October 2013, Jamie Dimon, for instance, gave up his chairmanship of the board of J.P. Morgan Chase's main banking subsidiary at the instigation of the Office of the Comptroller of the Currency. However, the resulting separation of Dimon's previous roles of CEO (of the parent bank) and chairman (of the subsidiary bank) at J.P. Morgan Chase potentially has the unintended effect of increasing bank risk.

requiring directors of banks to ensure the financial safety and soundness of the company ahead of the interests of its members.

Policy assessments thus tend to ignore that more effective boards as part of 'good' corporate governance potentially increase bank risk-taking beyond the level preferred by senior management. However, the evidence in this paper that good corporate governance is associated with lower bank capitalization does not necessarily imply that corporate governance schemes at banks should not be designed to be good. In the end, any disadvantage of good corporate governance in bringing about lower bank capitalization has to be balanced against any presumed benefits in terms of restricting management's ability to underperform in unrelated ways. Nevertheless, our analysis suggests that first and foremost reforms need to address policies that distort risk-taking incentives of shareholders, such as too-big-to-fail policies and government guarantees, for bank governance reforms to achieve their full intended effects.

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Appendix

Table A1. Variable definitions and data sources

Variable	Definition	Source
Tier 1 capital	Ratio of Tier 1 capital to risk-weighted assets	Worldscope
Total capital	Ratio of Tier 1 capital and Tier 2 capital to risk-weighted assets	Worldscope
Common equity	Ratio of common equity to total assets	Worldscope
Tangible capital	Ratio of tangible capital to tangible assets	Bankscope
Market value	Market value of common equity divided by total assets plus market value of common equity minus book value of common equity	Worldscope
Dividends	Dummy variable that equals one if the bank pays dividends, and zero otherwise	Worldscope
Repurchases	Dummy variable that equals one if the bank repurchases common shares, and zero otherwise	Worldscope
Total payout	Dummy variable that equals one if the bank has a positive payout in terms of dividends and repurchases of common shares, and zero otherwise	Worldscope
Net payout	Dummy variable that equals one if the bank has a positive payout in terms of dividends and repurchases of common shares net of common share issuance, and zero otherwise	Worldscope
Dividends to assets	Ratio of dividends to total assets	Worldscope
Repurchases to assets	Ratio of repurchases of common shares to total assets	Worldscope
Total payout to assets	Ratio of sum of dividends and repurchases of common shares to total assets	Worldscope
Net payout to assets	Ratio of sum of dividends and repurchases of common shares net of common share issuance to assets if positive, and zero otherwise	Worldscope
Board independence	Variable ranging from 1 to 6, with a higher value indicating a more independent board. Specifically, the variable equals 1 if a board is controlled by insiders, 2 if a board is controlled by a majority of insiders and affiliated outsiders, 3 if the fraction of independent board members lies between 50% and 67%, 4 if the fraction lies between 67% and 75%, 5 if the fraction lies between 75% and 90%, and 6 if the fraction is greater than 90% or the board has no more than one officer and no affiliated outsiders	CGQ
CEO chairman separation	Variable ranging from 1 to 3, with a higher value indicating better separation between the roles of CEO and chairman. Specifically, the variable equals 1 if CEO and chairman are combined, 2 if CEO and chairman are combined, but there is a counterbalancing governance structure, for instance a lead director, in place, and 3 if CEO and chairman are separated.	CGQ
Board size	Variable ranging from 1 to 5, with a higher score indicating a larger board membership. Specifically, board size = 1 if board membership < 6; board size = 2 if board membership ≥ 6 and ≤ 8; board size = 3 if board membership ≥ 9 and ≤ 12; board size = 4 if board membership ≥ 13 and ≤ 15; board size = 5 if board membership > 15	CGQ
Board size, effective	Variable ranging from 1 to 3, with a higher value indicating a more effective number of board members. Specifically board size, effective = 1 if board membership is < 6 or board membership > 15; board size, effective = 2 if board membership ≥ 6 and ≤ 8 or board membership ≥ 13 and ≤ 15; board size, effective = 3 if board membership ≥ 9 and ≤ 12	CGQ

Anti-takeover provision	Dummy variable that equals one if a bank is incorporated in a state (for U.S. banks) or a country (for non-U.S. banks) that allows anti-takeover provisions and has opted for such a protection. Specifically, the following six aspects of anti-takeover provisions are considered: control share acquisitions, control share cash outs, freeze-out provisions, fair price provisions, stakeholder laws, and poison pill endorsements. The dummy variable equals one if a bank is incorporated in a state or country with any one of these six provisions and has not opted out of all of them	CGQ
CEO total compensation	Logarithm of the value of total annual compensation granted to CEO	Capital IQ
CEO options	Logarithm of the cumulative value of options granted to CEO normalized by annual cash compensation	Capital IQ
CEO shares	Logarithm of the cumulative value of shares granted to CEO normalized by annual cash compensation	Capital IQ
CEO portfolio	Logarithm of the cumulative value of options and shares granted to CEO normalized by annual cash compensation	Capital IQ
CEO delta	Logarithm of the CEO's delta, defined as the dollar value change of the CEO's stock and option portfolio if the stock price increases by 1%	ExecuComp
CEO vega	Logarithm of the CEO's vega, defined as the dollar value change of a CEO's stock and option portfolio if the stock price volatility increases by 1%	ExecuComp
Assets	Logarithm of total assets	Bankscope
Return on assets	Ratio of pre-tax profits to total assets	Bankscope
Ownership	Dummy variable that equals one if a single owner has direct ownership of more than 10% of the bank	Bankscope
Fiscal balance	Government budget balance as a percentage of GDP	World Development Indicators
Income shock	Minus the change in the return on assets if the change in the return on assets is in the bottom 20% of the distribution of this variable, and zero otherwise	Bankscope

Table A2. Country coverage

The table provides information on the banks per country for which governance and compensation variables are available. Specifically, columns 1 to 3 relate to the number of distinct banks per country that are included in the regression in column 1 of Table 2 that includes the board independence variable, with column 3 reporting the assets of the banks in our sample as a fraction of the calculated total banking assets in the country. Columns 4 to 6 relate to the number of distinct banks per country that are included in the regression in column 1 of Table 4 that includes the CEO total compensation variable, with column 6 reporting the assets of the banks in our sample as a fraction of the calculated total banking assets in the country.

	Governance variable coverage			Compensation variable coverage		
Country	Number of banks (1)	Percentage (2)	Coverage by assets (3)	Number of banks (4)	Percentage (5)	Coverage by assets (6)
Australia	10	1.10%	75.20%	16	1.33%	64.85%
Austria	2	0.22%	16.45%	2	0.17%	16.35%
Belgium	4	0.44%	45.49%	3	0.25%	27.62%
Canada	11	1.21%	74.00%	16	1.33%	67.83%
Denmark	1	0.11%	41.31%	7	0.58%	42.42%
Finland	1	0.11%	12.81%	5	0.42%	7.95%
France	3	0.33%	30.31%	13	1.08%	21.33%
Germany	9	0.99%	35.80%	12	1.00%	33.26%
Greece	6	0.66%	81.65%	1	0.08%	26.75%
Hong Kong	14	1.54%	27.52%	17	1.41%	20.96%
Ireland	5	0.55%	61.17%	5	0.42%	33.44%
Italy	15	1.65%	43.38%	27	2.24%	46.99%
Japan	66	7.26%	44.18%	4	0.33%	15.53%
Netherlands	3	0.33%	46.06%	10	0.83%	39.70%
Norway	2	0.22%	23.09%	16	1.33%	45.73%
Portugal	3	0.33%	27.84%	3	0.25%	35.11%
Singapore	6	0.66%	54.78%	2	0.17%	28.24%
Spain	4	0.44%	53.70%	7	0.58%	36.36%
Sweden	5	0.55%	72.49%	8	0.66%	69.06%
Switzerland	6	0.66%	23.81%	23	1.91%	48.76%
UK	23	2.53%	33.59%	38	3.16%	28.68%
USA	710	78.11%	48.92%	969	80.48%	45.62%
Total	909	100.00%		1204	100.00%	

Table 1. Summary statistics

This table provides summary statistics for all variables. For variable definitions see the Appendix.

Variable	Obs	Mean	Std. dev.	Min	Max
Tier 1 capital	5268	0.1192	0.0393	0.0003	0.3970
Total capital	5393	0.1371	0.0367	0.0007	0.3978
Common equity	6743	0.0888	0.0451	0.0005	0.3991
Tangible capital	5628	0.0785	0.0441	0	0.3997
Market value	6599	0.1220	0.0685	0	0.3983
Dividends	6907	0.8393	0.3673	0	1
Repurchases	6899	0.5839	0.4930	0	1
Total payout	6906	0.8863	0.3174	0	1
Net payout	6788	0.7575	0.4286	0	1
Dividends to assets	6865	0.0034	0.0051	0	0.0914
Repurchases to assets	6897	0.0025	0.0059	0	0.0826
Total payout to assets	6904	0.0060	0.0101	0	0.1877
Net payout to assets	6786	0.0048	0.0091	0	0.1862
Board independence	3542	3.8639	1.3248	2	6
CEO chairman separation	3286	2.2319	0.9267	1	3
Board size	3644	3.1018	0.9848	1	5
Board size, effective	3644	2.3093	0.7092	1	3
Anti-takeover provision	3646	0.1097	0.3126	0	1
CEO total compensation	5918	13.2390	1.2744	0	17.4808
CEO options	2911	-0.0612	1.7690	-9.5426	8.2005
CEO shares	1329	-0.7935	1.6697	-8.1635	14.7435
CEO portfolio	1851	-0.4311	1.8046	-9.5426	14.7435
CEO delta	819	4.7437	1.6907	0	9.8411
CEO vega	657	3.3640	1.6143	0.0054	7.9377
Assets	6229	8.3696	2.3463	1.3529	15.1236
Returns on assets	6683	0.0066	0.0184	-0.1992	0.1958
Ownership	2071	0.2318	0.4221	0	1
Fiscal balance	2070	-2.9859	1.9291	-9.8530	20.0096
Income shock	1079	0.0170	0.0218	0.0036	0.2247

Table 2. Bank capitalization ratios and corporate governance, 2004-2008

The dependent variables in columns 1 to 5 are Tier 1 capital, Total capital, Common equity, Tangible capital and Market value, respectively. Tier 1 capital is the ratio of Tier 1 capital to risk-weighted assets. Total capital is the ratio of Tier 1 capital and Tier 2 capital to risk-weighted assets. Common equity is the ratio of common equity to total assets. Tangible capital is the ratio of tangible capital to tangible assets. Market value is the market value of common equity divided by total assets plus the market value of common equity minus the book value of common equity. Assets is the logarithm of total assets. Return on assets the ratio of pre-tax profits to total assets. Ownership is a dummy variable that equals one if a single owner possesses more than 10% of the bank. Board independence is a variable ranging from 1 to 6, with a higher value indicating a more independent board. CEO chairman separation is a variable ranging from 1 to 3, with a higher value indicating better separation between the roles of CEO and chairman. Board size is a variable ranging from 1 to 5, with a higher score indicating a larger board membership. Board size, effective is a variable ranging from 1 to 3, with a higher value indicating a more effective number of board members. Anti-takeover provision is a dummy variable that equals one if a bank is incorporated in a state or country that allows anti-takeover provisions and has opted for such protection. Regressions in Panels B-E also include the Lagged assets, Lagged return on assets, and Lagged ownership variables that are unreported. Regressions include country-year fixed effects. Standard errors are adjusted for clustering at the bank level, and provided in parentheses. *, ** and *** denote significance at 10%, 5%, and 1%, respectively.

Panel A	Tier 1 capital (1)	Total capital (2)	Common equity (3)	Tangible capital (4)	Market value (5)
Lagged assets	-0.008***	-0.004***	-0.005***	-0.009***	-0.002
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Lagged return on assets	0.736***	0.687***	1.433***	1.117**	2.701***
	(0.282)	(0.260)	(0.451)	(0.520)	(0.911)
Lagged ownership	0.002	0.004	0.006	0.007**	0.005
	(0.003)	(0.003)	(0.004)	(0.004)	(0.005)
Lagged board independence	-0.001	-0.001	-0.001	-0.001	0.002*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
N	2071	2149	2366	2238	2322
adj. R-sq	0.186	0.102	0.262	0.278	0.392
Panel B					
Lagged CEO chairman separation	0.000	-0.000	-0.002	-0.002*	-0.003
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
N	1976	1984	2140	1991	2109
adj. R-sq	0.192	0.095	0.306	0.381	0.498
Panel C					
Lagged board size	-0.002	-0.002*	0.003*	-0.000	0.005**
	(0.002)	(0.001)	(0.002)	(0.002)	(0.003)
N	2110	2188	2411	2277	2367
adj. R-sq	0.207	0.120	0.287	0.284	0.405
Panel D					
Lagged board size, effective	-0.002	-0.003	-0.007***	-0.005***	-0.003
	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)
N	2110	2188	2411	2277	2367
adj. R-sq	0.208	0.119	0.297	0.290	0.401
Panel E					
Lagged anti-takeover provision	0.011***	0.012***	0.007**	0.004	-0.013*
	(0.003)	(0.003)	(0.004)	(0.004)	(0.007)
N	2110	2188	2412	2278	2368
adj. R-sq	0.211	0.122	0.285	0.285	0.401

Table 3. Bank capitalization ratios, corporate governance, and the fiscal balance, 2004-2008

The dependent variables in columns 1 to 5 are Tier 1 capital, Total capital, Common equity, Tangible capital and Market value, respectively. Tier 1 capital is the ratio of Tier 1 capital to risk-weighted assets. Total capital is the ratio of Tier 1 capital and Tier 2 capital to risk-weighted assets. Common equity is the ratio of common equity to total assets. Tangible capital is the ratio of tangible capital to tangible assets. Market value is the market value of common equity divided by total assets plus the market value of common equity minus the book value of common equity. Assets is the logarithm of total assets. Return on assets the ratio of pre-tax profits to total assets. Ownership is a dummy variable that equals one if a single owner possesses more than 10% of the bank. Fiscal balance is the government budget balance as a percentage of GDP. Board independence is a variable ranging from 1 to 6, with a higher value indicating a more independent board. CEO chairman separation is a variable ranging from 1 to 3, with a higher value indicating better separation between the roles of CEO and chairman. Board size is a variable ranging from 1 to 5, with a higher score indicating a larger board membership. Board size, effective is a variable ranging from 1 to 3, with a higher value indicating a more effective number of board members. Anti-takeover provision is a dummy variable that equals one if a bank is incorporated in a state or country that allows anti-takeover provisions and has opted for such protection. Regressions in Panels B-E also include the Lagged assets, Lagged return on assets, and Lagged ownership variables that are unreported. Regressions include country-year fixed effects. Standard errors are adjusted for clustering at the bank level, and provided in parentheses. *, ** and *** denote significance at 10%, 5%, and 1%, respectively.

Panel A	Tier 1 capital (1)	Total capital (2)	Common equity (3)	Tangible capital (4)	Market value (5)
Lagged assets	-0.008***	-0.004***	-0.005***	-0.008***	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Lagged return on assets	0.734***	0.703**	1.263***	1.041*	2.623***
	(0.282)	(0.278)	(0.456)	(0.566)	(0.989)
Lagged ownership	0.002	0.004	0.004	0.006*	0.004
	(0.003)	(0.003)	(0.004)	(0.003)	(0.004)
Lagged board independence	-0.003*	-0.002*	-0.004***	-0.004**	0.001
	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)
Lagged board independence * Lagged fiscal	-0.001	-0.000	-0.001**	-0.001*	-0.001
balance	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)
N	2069	2105	2298	2165	2261
adj. R-sq	0.186	0.094	0.255	0.273	0.400
Panel B					
Lagged CEO chairman separation	-0.004**	-0.003**	-0.002	-0.001	-0.004**
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Lagged CEO chairman separation * Lagged fiscal	-0.001***	-0.001***	0.000	0.000	-0.001
balance	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)
N	1976	1984	2137	1988	2107
adj. R-sq	0.194	0.096	0.304	0.377	0.498
Panel C					
Lagged board size	0.002	-0.001	0.002	-0.002	0.001
	(0.002)	(0.002)	(0.003)	(0.002)	(0.003)
Lagged board size * Lagged fiscal balance	0.001**	0.001	0.000	-0.000	-0.001
	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)
N	2108	2144	2343	2204	2306
adj. R-sq	0.208	0.112	0.278	0.279	0.412
Panel D					
Lagged board size, effective	-0.004**	-0.001	-0.009***	-0.005**	-0.003
	(0.002)	(0.002)	(0.002)	(0.003)	(0.004)
Lagged board size, effective * Lagged fiscal	-0.001	0.001	-0.001	-0.000	-0.000
balance	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
N	2108	2144	2343	2204	2306
adj. R-sq	0.208	0.111	0.290	0.283	0.409
Panel E					
Lagged anti-takeover provision	0.003	0.001	0.006	0.005	0.004
	(0.005)	(0.005)	(0.008)	(0.008)	(0.017)
	-0.003	-0.003*	-0.000	0.001	0.005

Lagged anti-takeover provision * Lagged fiscal balance	(0.002)	(0.002)	(0.002)	(0.002)	(0.005)
N	2108	2144	2344	2205	2307
adj. R-sq	0.211	0.114	0.277	0.278	0.410

Table 4. Bank capitalization ratios and executive compensation internationally, 2003-2011

The dependent variables in columns 1 to 5 are Tier 1 capital, Total capital, Common equity, Tangible capital and Market value, respectively. Tier 1 capital is the ratio of Tier 1 capital to risk-weighted assets. Total capital is the ratio of Tier 1 capital and Tier 2 capital to risk-weighted assets. Common equity is the ratio of common equity to total assets. Tangible capital is the ratio of tangible capital to tangible assets. Market value is the market value of common equity divided by total assets plus the market value of common equity minus the book value of common equity. Assets is the logarithm of total assets. Return on assets the ratio of pre-tax profits to total assets. Ownership is a dummy variable that equals one if a single owner possesses more than 10% of the bank. CEO total compensation is the logarithm of the value of total annual compensation granted to CEO. CEO options is the logarithm of the ratio of the cumulative value of options granted to CEO to his annual cash compensation. CEO shares is the logarithm of the ratio of the cumulative value of shares granted to CEO to his annual cash compensation. CEO portfolio is the logarithm of the ratio of the cumulative value of options and shares granted to CEO to his annual cash compensation. Regressions in Panels B-D also include the Lagged assets, Lagged return on assets, and Lagged ownership variables that are unreported. Regressions include bank fixed effects and year fixed effects. Information on stock grants is recorded in Capital IQ from 2006. The regressions in Panel C-D, therefore, cover only the period of 2007-2011. Standard errors are adjusted for clustering at the bank level, and provided in parentheses. *, ** and *** denote significance at 10%, 5%, and 1%, respectively.

	Tier 1 capital	Total capital	Common equity	Tangible capital	Market value
Panel A	(1)	(2)	(3)	(4)	(5)
Lagged assets	-0.008**	-0.007*	-0.009***	-0.014***	-0.031***
	(0.004)	(0.004)	(0.003)	(0.003)	(0.004)
Lagged return on assets	0.361***	0.314***	0.648***	0.404***	0.767***
	(0.097)	(0.097)	(0.093)	(0.115)	(0.133)
Lagged ownership	-0.002	-0.001	-0.001	-0.002	-0.003
	(0.002)	(0.002)	(0.001)	(0.001)	(0.002)
Lagged CEO total	-0.002	-0.001	-0.001	-0.001	-0.000
compensation	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
N	4417	4410	4880	4826	4726
adj. R-sq	0.084	0.078	0.157	0.169	0.634
Panel B					
Lagged CEO options	0.000	-0.000	0.001	0.001	0.002***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
N	2332	2325	2613	2425	2562
adj. R-sq	0.099	0.106	0.071	0.166	0.592
Panel C					
Lagged CEO shares	0.003**	0.003**	0.002**	0.003***	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
N	838	835	927	917	912
adj. R-sq	0.156	0.161	0.161	0.133	0.322
Panel D					
Lagged CEO portfolio	0.001*	0.001	0.002***	0.002***	0.002*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
N	1194	1194	1299	1285	1278
adj. R-sq	0.154	0.156	0.161	0.116	0.377

Table 5. Bank capitalization ratios and executive incentives for the US case, 2003-2011

The dependent variables in columns 1 to 5 are Tier 1 capital, Total capital, Common equity, Tangible capital and Market value, respectively. Tier 1 capital is the ratio of Tier 1 capital to risk-weighted assets. Total capital is the ratio of Tier 1 capital and Tier 2 capital to risk-weighted assets. Common equity is the ratio of common equity to total assets. Tangible capital is the ratio of tangible capital to total assets. Market value is the market value of common equity divided by total assets plus the market value of common equity minus the book value of common equity. Assets is the logarithm of total assets. Return on assets the ratio of pre-tax profits to total assets. Ownership is a dummy variable that equals one if a single owner possesses more than 10% of the bank. CEO delta is the logarithm of the CEO's delta, defined as the dollar value change of the CEO's stock and option portfolio if the stock price increases by 1%. CEO vega is the logarithm of the CEO's vega, defined as the dollar value change of a CEO's stock and option portfolio if the stock price volatility increases by 1%. Regressions include year fixed effects. Standard errors are adjusted for clustering at the bank level, and provided in parentheses. *, ** and *** denote significance at 10%, 5%, and 1%, respectively.

	Tier 1 capital	Total capital	Common equity	Tangible capital	Market value
	(1)	(2)	(3)	(4)	(5)
Lagged assets	0.004	0.009	-0.009	-0.020**	-0.049***
	(0.008)	(0.008)	(0.006)	(0.008)	(0.010)
Lagged return on assets	0.062	0.102	0.483**	0.082	0.634**
	(0.283)	(0.276)	(0.199)	(0.201)	(0.281)
Lagged ownership	-0.009**	-0.011**	-0.007**	-0.006*	-0.002
	(0.005)	(0.004)	(0.003)	(0.003)	(0.007)
Lagged CEO delta	0.005	0.003	0.002	0.007*	0.007***
	(0.006)	(0.006)	(0.002)	(0.004)	(0.003)
Lagged CEO vega	-0.009	-0.009	-0.003	-0.008**	-0.005*
	(0.006)	(0.006)	(0.003)	(0.004)	(0.003)
N	486	483	622	507	611
adj. R-sq	0.119	0.121	0.132	0.199	0.685

Table 6. Payouts to shareholders of badly performing banks and corporate governance, 2004-2008

The dependent variables in columns 1-4 are Dividends, Repurchases, Total payout and Net payout, respectively. Dividends is a dummy variable that equals one if the bank pays dividends, and zero otherwise. Repurchases is a dummy variable that equals one if the bank repurchases common shares, and zero otherwise. Total payout is a dummy variable that equals one if the bank has a positive payout in terms of dividends and repurchases of common shares, and zero otherwise. Net payout is a dummy variable that equals one if the bank has a positive payout in terms of dividends and repurchases of common shares net of common share issuance, and zero otherwise. The dependent variables in columns 5-8 are Dividends to assets, Repurchases to assets, Total payout to assets and Net payout to assets, respectively. Dividends to assets is the ratio of dividends to total assets. Repurchases to assets is the ratio of repurchases of common shares to total assets. Total payout to assets is the ratio of the sum of dividends and purchases of common shares to total assets. Net payout to asset is the ratio of the sum of dividends and repurchases of common shares net of common share issuance to assets if positive, and zero otherwise. Income shock is minus the change in the return on assets if the change in the return on assets is in the bottom 20% of the distribution of this variable, and zero otherwise. Board independence is a variable ranging from 1 to 6, with a higher value indicating a more independent board. CEO chairman separation is a variable ranging from 1 to 3, with a higher value indicating better separation between the roles of CEO and chairman. Board size is variable ranging from 1 to 5, with a higher score indicating a larger board membership. Board size, effective is a variable ranging from 1 to 3, with a higher value indicating a more effective number of board members. Anti-takeover provision is a dummy variable that equals one if a bank is incorporated in a state or country that allows anti-takeover provisions and has opted for such protection. Columns 1-4 show the results of Probit model estimation, while columns 5-8 show the results of Tobit model estimation. Regressions in Panels B-E also include the Income shock variable that is unreported. Regressions include bank fixed effects and year fixed effects. Standard errors are adjusted for clustering at the bank level, and provided in parentheses. *, ** and *** denote significance at 10%, 5%, and 1%, respectively.

	Probit				Tobit			
Panel A	Dividends	Repurchases	Total payout	Net payout	Dividends to assets	Repurchases to assets	Total payout to assets	Net payout to assets
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Lagged income shock	-9.541	2.475	-79.411***	-5.743	0.038	-0.059	-0.025	-0.042
	(14.272)	(12.332)	(24.048)	(13.861)	(0.045)	(0.086)	(0.095)	(0.120)
Lagged board independence	0.067	0.089**	0.013	-0.008	0.000	0.000	0.000	0.000
	(0.059)	(0.038)	(0.063)	(0.041)	(0.000)	(0.000)	(0.000)	(0.000)
Lagged board independence * Lagged income shock	-4.287	-5.270	9.851	-4.193	-0.014	0.014	0.009	0.010
	(4.563)	(4.462)	(6.122)	(5.034)	(0.018)	(0.037)	(0.042)	(0.049)
N	2131	2225	2069	2204	2285	2287	2287	2263
pseudo R-sq	0.049	0.052	0.079	0.082	-0.014	-0.022	-0.013	-0.018
Panel B								
Lagged CEO chairman separation	-0.106	-0.042	-0.106	0.007	-0.000	-0.001**	-0.001**	-0.000
	(0.070)	(0.046)	(0.069)	(0.045)	(0.000)	(0.000)	(0.000)	(0.000)
Lagged CEO chairman separation * Lagged income shock	1.112	-11.583*	-8.623	-6.384	-0.013	-0.081*	-0.055	-0.081
	(8.750)	(6.869)	(8.665)	(7.854)	(0.033)	(0.045)	(0.051)	(0.058)
N	1854	1948	1841	1932	2023	2025	2025	2003
pseudo R-sq	0.045	0.044	0.074	0.081	-0.013	-0.029	-0.012	-0.019
N	2156	2246	2088	2231	2319	2321	2321	2296
pseudo R-sq	0.087	0.054	0.104	0.087	-0.016	-0.025	-0.014	-0.019
Panel C								
Lagged board size	0.209***	-0.019	0.193***	-0.016	0.000*	-0.000	0.000	-0.000
	(0.076)	(0.046)	(0.068)	(0.047)	(0.000)	(0.000)	(0.000)	(0.000)

Lagged board size * Lagged income shock	13.652***	11.169***	-1.608	5.928*	0.019*	0.024*	0.024	0.015
	(4.160)	(3.492)	(10.078)	(3.491)	(0.011)	(0.012)	(0.015)	(0.023)
N	2156	2246	2088	2231	2319	2321	2321	2296
pseudo R-sq	0.087	0.054	0.104	0.087	-0.016	-0.025	-0.014	-0.019
Panel D								
Lagged board size, effective	0.142*	0.030	-0.002	0.067	-0.000	-0.000	-0.000	-0.000
	(0.080)	(0.059)	(0.089)	(0.061)	(0.000)	(0.000)	(0.000)	(0.000)
Lagged board size, effective * Lagged income shock	-21.893***	-13.839***	-1.332	-11.559**	-0.015	-0.007	0.004	-0.016
	(6.080)	(5.161)	(12.384)	(5.484)	(0.018)	(0.024)	(0.028)	(0.032)
N	2156	2246	2088	2231	2319	2321	2321	2296
pseudo R-sq	0.070	0.053	0.090	0.088	-0.015	-0.024	-0.014	-0.019
Panel E								
Lagged anti-takeover provision	0.605***	0.161	0.415*	0.488***	0.002***	0.000	0.001	0.002*
	(0.228)	(0.173)	(0.226)	(0.178)	(0.001)	(0.001)	(0.001)	(0.001)
Lagged anti-takeover provision * Lagged income shock	32.358	18.509	27.299	21.242	0.064	0.080	0.107	0.109
	(20.355)	(15.516)	(19.551)	(17.021)	(0.061)	(0.070)	(0.084)	(0.088)
N	2156	2246	2088	2231	2320	2322	2322	2297
pseudo R-sq	0.073	0.051	0.099	0.093	-0.017	-0.024	-0.014	-0.020

Table 7. Payouts to shareholders of badly performing banks and executive compensation internationally, 2003-2011

The dependent variables in columns 1-4 are Dividends, Repurchases, Total payout and Net payout, respectively. Dividends is a dummy variable that equals one if the bank pays dividends, and zero otherwise. Repurchases is a dummy variable that equals one if the bank repurchases common shares, and zero otherwise. Total payout is a dummy variable that equals one if the bank has a positive payout in terms of dividends and repurchases of common shares, and zero otherwise. Net payout is a dummy variable that equals one if the bank has a positive payout in terms of dividends and repurchases of common shares net of common share issuance, and zero otherwise. The dependent variables in columns 5-8 are Dividends to assets, Repurchases to assets, Total payout to assets and Net payout to assets, respectively. Dividends to assets is the ratio of dividends to total assets. Repurchases to assets is the ratio of repurchases of common shares to total assets. Total payout to assets is the ratio of the sum of dividends and purchases of common shares to total assets. Net payout to asset is the ratio of the sum of dividends and repurchases of common shares net of common share issuance to assets if positive, and zero otherwise. Income shock is minus the change in the return on assets if the change in the return on assets is in the bottom 20% of the distribution of this variable, and zero otherwise. CEO total compensation is the logarithm of the value of total annual compensation granted to CEO. CEO options is the logarithm of the ratio of the cumulative value of options granted to CEO to his annual cash compensation. CEO shares is the logarithm of the ratio of the cumulative value of shares granted to CEO to his annual cash compensation. CEO portfolio is the logarithm of the ratio of the cumulative value of options and shares granted to CEO to his annual cash compensation. Columns 1-4 show the results of Probit model estimation, while columns 5-8 show the results of Tobit model estimation. Information on stock grants is recorded in Capital IQ from 2006. The regressions in Panels C-D therefore cover only the period of 2007-2011. Regressions in Panels B-D also include the Income shock variable that is unreported. Regressions include bank fixed effects and year fixed effects. Standard errors are adjusted for clustering at the bank level, and provided in parentheses. *, ** and *** denote significance at 10%, 5%, and 1%, respectively.

	Probit				Tobit			
Panel A	Dividends	Repurchases	Total payout	Net payout	Dividends to assets	Repurchases to assets	Total payout to assets	Net payout to assets
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Lagged income shock	-104.513***	-8.094	-94.828**	-61.215**	-0.146	-0.208	-0.196	-0.385
	(40.018)	(31.612)	(38.740)	(30.844)	(0.351)	(0.271)m	(0.400)	(0.519)
Lagged CEO total compensation	0.089***	0.142***	0.143***	0.051**	0.000	0.001***	0.001***	0.000**
	(0.029)	(0.031)	(0.033)	(0.022)	(0.000)	(0.000)	(0.000)	(0.000)
Lagged CEO total compensation * Lagged income shock	5.730*	0.260	5.847**	3.878*	0.011	0.015	0.018	0.035
	(3.033)	(2.323)	(2.786)	(2.191)	(0.024)	(0.020)	(0.029)	(0.040)
N	4215	4311	4182	3949	4429	4470	4466	4073
pseudo R-sq	0.094	0.075	0.107	0.053	-0.023	-0.044	-0.018	-0.020
Panel B								
Lagged CEO options	-0.054	0.097***	-0.023	-0.100***	-0.000	0.001***	0.001***	0.000
	(0.033)	(0.026)	(0.038)	(0.029)	(0.000)	(0.000)	(0.000)	(0.000)
Lagged CEO options * Lagged income shock	12.476**	5.820	20.893***	8.066	0.120**	0.045	0.133**	0.087**
	(6.053)	(4.646)	(7.466)	(5.498)	(0.059)	(0.032)	(0.058)	(0.041)
N	2337	2340	2334	2226	2361	2368	2366	2254
pseudo R-sq	0.018	0.031	0.024	0.038	-0.008	-0.024	-0.013	-0.013
Panel C								
Lagged CEO shares	0.105**	0.181***	0.207***	0.028	0.000*	0.001***	0.001***	0.001**
	(0.046)	(0.038)	(0.051)	(0.040)	(0.000)	(0.000)	(0.000)	(0.000)
Lagged CEO shares * Lagged income shock	-0.338	1.851	2.876**	2.095	0.001	0.019	-0.023	-0.034
	(2.645)	(1.434)	(1.434)	(1.440)	(0.008)	(0.015)	(0.043)	(0.040)

N	883	883	884	783	868	883	884	783
pseudo R-sq	0.139	0.105	0.200	0.071	-0.011	-0.031	-0.010	-0.015
Panel D								
Lagged CEO portfolio	0.088**	0.165***	0.173***	0.009	0.000	0.001***	0.001***	0.001***
	(0.037)	(0.029)	(0.044)	(0.030)	(0.000)	(0.000)	(0.000)	(0.000)
Lagged CEO portfolio * Lagged income shock	2.321	1.921	3.647***	2.759*	0.012	0.019	-0.008	-0.021
	(2.659)	(1.385)	(1.357)	(1.466)	(0.008)	(0.015)	(0.032)	(0.033)
N	1209	1210	1209	1081	1216	1232	1233	1102
pseudo R-sq	0.117	0.095	0.163	0.077	-0.011	-0.035	-0.009	-0.016

Figure 1. This figure displays the unweighted yearly mean of Tier 1 capital, which is the ratio of Tier 1 capital to risk weighted assets.

Figure 2. This figure displays the unweighted yearly mean of Total capital, which is the ratio of Tier 1 plus Tier 2 capital to risk weighted assets.

Figure 3. This figure displays the unweighted yearly mean of common equity, which is the ratio of the book value of common equity to total assets.

Figure 4. This figure displays the unweighted yearly mean of tangible capital, which is the ratio of tangible capital to tangible assets.

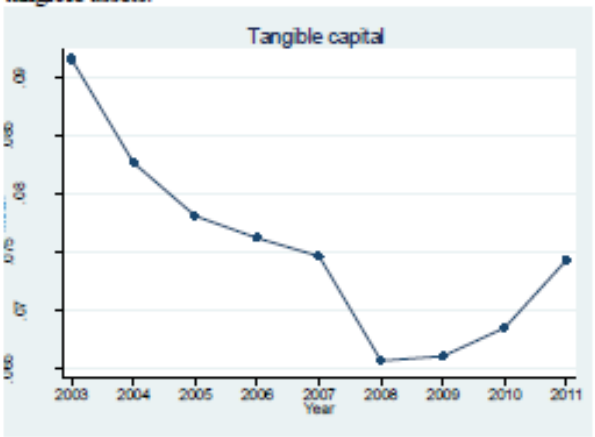

Figure 5. This figure displays the unweighted yearly mean of market value, which is the market value of common equity divided by total assets plus the market value of common equity minus the book value of common equity.

Figure 6. This figure displays the unweighted yearly average ratio of dividends to total assets.

Figure 7. This figure displays the unweighted yearly average ratio of common stock repurchases to total assets.

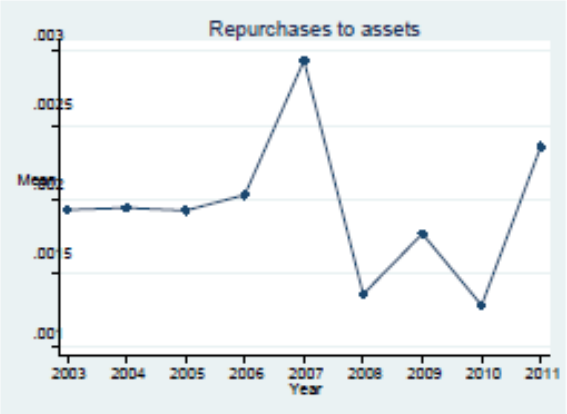

Figure 8. This figure displays the unweighted yearly average ratio of total payout (dividends plus repurchases) to total assets.

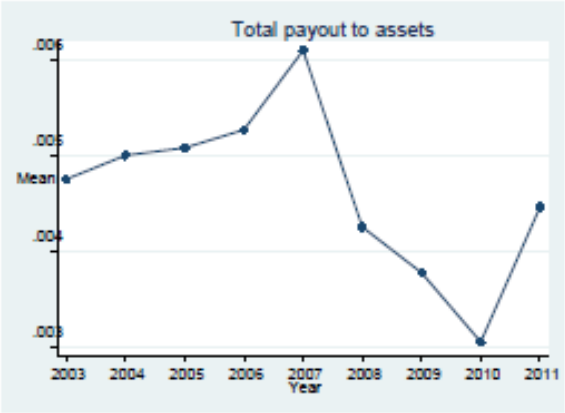

Figure 9. This figure displays the unweighted yearly average ratio of the payout net of private stock issuance to total assets. The value is negative when issuance exceeds the sum of dividends and repurchases.

Figure 10. The figure displays the fraction of banks that experiences income shocks. An income shock is defined as a change in the return on assets in the bottom 20% of the sample.